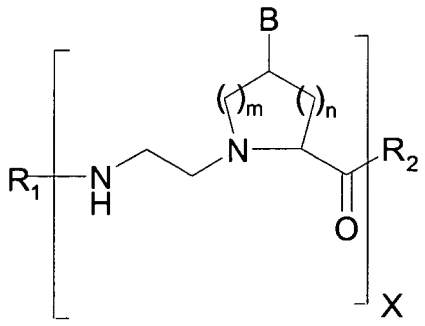
IN THE CLAIMS:

The following listing replaces all prior versions of the claims.

1-13. (Cancelled)

14. (Previously presented) A compound having the formula

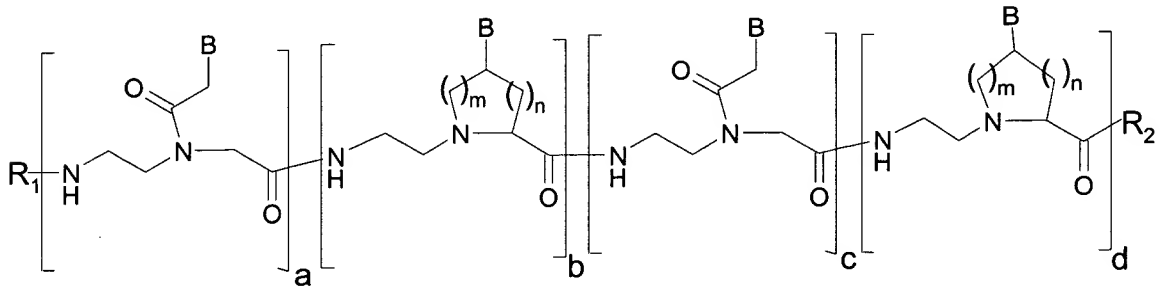


aep PNA II

wherein

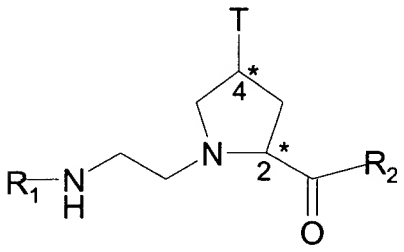
- m and n are 1 to 2 and x = 1-20;
- each of B is independently selected from the group consisting of H, HO, NH_2, naturally occurring nucleobases adenine (A), thymine (T), cytosine (C) and guanine (G), non-naturally occurring nucleobases, DNA intercalators, heterocyclic moieties and reporter ligands;
- each chiral monomeric unit is independently selected from the four possible diastereomers; and
- R_1=H or Flurophore or Biotin, R_2=OH or $NH(CH_2)_2COOH$ or $NH(CH_2)_3NH(CH_2)_4NH(CH_2)_3NH_2$.

15. (Previously presented) A compound having the formula



aep PNA **III**

that is heteropolymeric aepPNA **III** comprising non-chiral *aeg* unit of aminoethylglycyl PNA **I** and chiral *aep* monomeric unit **IV**



IV

wherein

- each chiral monomer unit is independently selected from the four possible diastereomers;
- a, b, c, d, m, n are integers with independent values in the range 1 to10;
- R_1 is H, $COCH_3$ or L (L = dansyl, carboxyfluoresceinyl);
- R_2 is OH, NH_2, $NHCH_2CH_2COOH$, or $NH(CH_2)_3NH(CH_2)_4$ $NH(CH_2)_3NH_2$; and
- each of B is independently selected from the group consisting of H, HO, NH_2, naturally occurring nucleobases, non-naturally occurring nucleobases, DNA intercalators, heterocyclic moieties and reporter ligands.

16. (Previously presented) The compound as claimed in claim 15, wherein

i) m=n=1, B=T, R_1=H, R_2= $NH(CH_2CH_2)COOH$, a=7, b=1, c=d=0;

ii) m=n=1, B=T, R_1=H, R_2= $NH(CH_2CH_2)COOH$, a=c=3, b=d=1;

iii) m=n=1, B=T, R_1=H, R_2= $NH(CH_2CH_2)COOH$, a=b=c=d=1, repeating twice in that order;

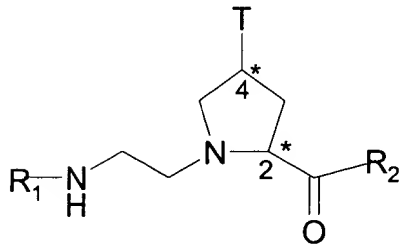
iv) m=n=1, B=T, R_1=H, R_2= $NH(CH_2CH_2)COOH$, a=b=c=0, d=8; and

v) m=n=1, B=T, R_1=H, R_2= $NH(CH_2CH_2)COOH$, a=d=0, b=1, c=7.

17. (Previously presented) The compound as claimed in claim 15, wherein said compound is synthesized by adaptation of standard solution phase peptide synthesis procedures or standard solid phase peptide synthesis procedures.

18. (Previously presented) The compound as claimed in claim 16, wherein said compound is synthesized by adaptation of standard solution phase peptide synthesis procedures or standard solid phase peptide synthesis procedures.

19. (Previously presented) A monomer precursor-synthon of formula **IV**



IV

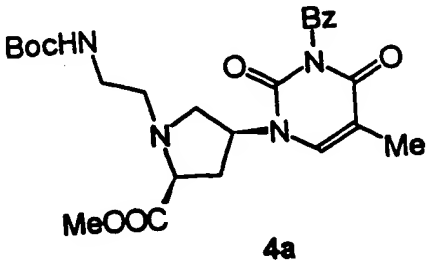
wherein

- R_1=H, Boc or Fmoc:
- R_2 = OMe, H, OEt or OBenzyl;
- chirality at positions 2 and 4 results in four diastereomers (2*S*,4*R*), (2*R*,4*S*), (2*S*,4*S*) and (2*R*,4*R*); and
- T is a nucleobase.

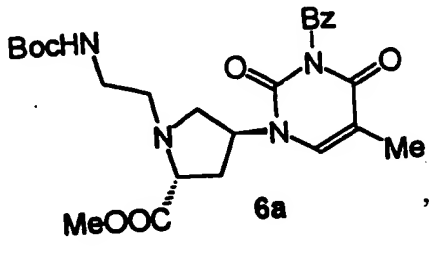
20. (Previously presented) The monomer precursor-synthon as claimed in claim 19 wherein T is a naturally occurring nucleobase.

21. (Canceled)

22. (Currently amended) A process for sequence specific recognition of a ~~single or double stranded polynucleotide DNA or RNA~~ compound according to claim 14, wherein said compound is a single or double stranded polynucleotide DNA or RNA, comprising contacting a compound of formula 4a or 6a ~~using compounds of formulae 4a and 6a~~



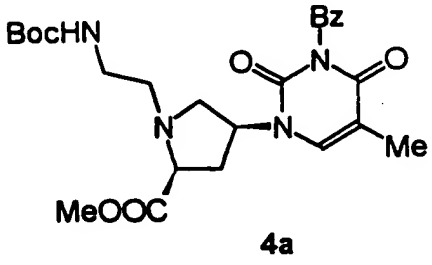
4a



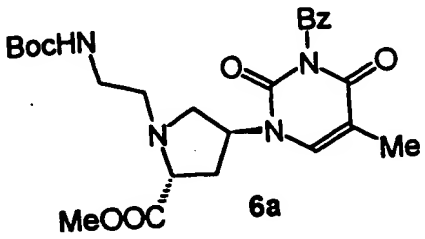
6a ,

with a composition, and detecting a binding product comprising the compound of formula 4a or 6a in said composition.

23. (Currently amended) A process for sequence specific recognition of a ~~single or double stranded polynucleotide DNA or RNA~~ compound according to claim 15, wherein said compound is a single or double stranded polynucleotide DNA or RNA, comprising contacting a compound of formula 4a or 6a ~~using compounds of formulae 4a and 6a~~



4a



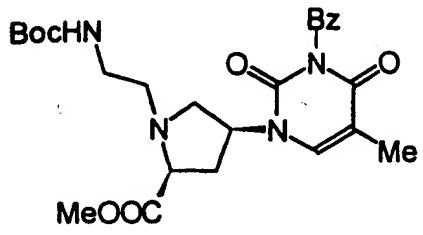
6a

with a composition, and detecting a binding product comprising the compound of formula 4a or 6a in said composition.

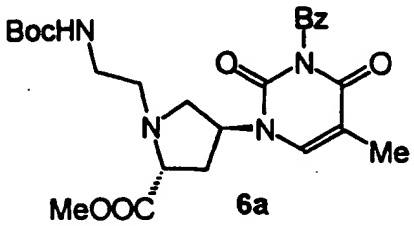
24. (Previously presented) A pharmaceutical composition comprising a compound according to claim 14, along with any other pharmaceutically effective agent.

25. (Previously presented) A pharmaceutical composition comprising a compound according to claim 15, along with any other pharmaceutically effective agent.

26. (Previously presented) A process for preparing compounds of formulae 4a and 6a



4a



6a

comprising the steps of

A. a) synthesizing (N-Boc)-2-aminoethanol from 2-aminoethanol;

b) synthesizing (N-Boc)-2-aminoethylbromide from (N-Boc)-2-aminoethanol;

B. N-alkylation of 4-hydroxyprolinemethylester with (N-Boc)-2-aminoethanol prepared as in step A;

(i) alkylation of 4*R*-hydroxy-2*S*-prolinemethylester with (N-Boc)-2-aminoethylbromide to obtain 1-(N-Boc-aminoethyl)-4*R*-hydroxy-2*S*-prolinemethyl ester;

(ii) alkylation of 4*R*-hydroxy-2*R*-prolinemethylester with (N-Boc)-2-aminoethyl bromide to obtain 1-(N-Boc-aminoethyl)-4*R*-hydroxy-2*R*-prolinemethyl ester;

(iii) alkylation of 4*S*-hydroxy-2*R*-prolinemethylester with (N-Boc)-2-aminoethyl bromide to obtain 1-(N-Boc-aminoethyl)-4*S*-hydroxy-2*R*-prolinemethylester;

(iv) alkylation of 4*S*-hydroxy-2*S*-prolinemethylester with (N-Boc)-2-aminoethyl bromide to obtain 1-(N-Boc-aminoethyl)-4*S*-hydroxy-2*S*-prolinemethylester;

C. Mitsunobu reaction of compounds 1-(N-Boc-aminoethyl)-4*R*-hydroxy-2*S*-prolinemethyl ester and (N-Boc)-2-aminoethanol prepared according to steps B(i) and B(ii) with N3-benzoylthymine, to produce monomer synthons of formulae 4a and **6a,** respectively.